

2014 Maryland FMP Report (October 2015)

Section 3. Atlantic croaker (*Micropogonias undulatus*) and Spot (*Leiostomus xanthurus*)

Atlantic croaker and spot are important components of both the commercial and recreational fisheries in Chesapeake Bay. In addition, spot are utilized as bait by the recreational sector. Spot and croaker are important prey items for predators such as spotted seatrout, red drum, striped bass, bluefish, marine mammals and many bird species. Their importance as prey and their dependence on coastal estuaries for juvenile habitat make them a consideration in ecosystem management.

Fishery Management Plans (FMPs)

The Chesapeake Bay Atlantic Croaker and Spot Fishery Management Plan (CaS FMP) was adopted in 1991. The FMP's goal is to: "Protect the Atlantic croaker and spot resource in the Chesapeake Bay, its tributaries, and coastal waters, while providing the greatest long term ecological, economic, and social benefits from their usage over time." To accomplish this goal, management strategies were developed to prohibit the harvest of small fish (age 1 and younger) of both species and to recommend monitoring and research programs for stock assessments and habitat needs. The CaS FMP was reviewed in 2014 by the Maryland Plan Review Team. It was determined that the plan is an appropriate framework for managing the croaker and spot resources. The team recommended that the plan be reviewed again in 2017 after the completion of coastal stock assessments and the development of new management triggers.

The Atlantic States Marine Fisheries Commission (ASMFC) adopted coastal FMPs for each species in 1987. The main purpose of the plans was to decrease the number of small fish caught as bycatch in the coastal shrimp trawl fishery. Bycatch reduction devices were required in the offshore coastal areas and have reduced the number of small fish caught in the trawl fishery. Amendment 1 to the croaker FMP was adopted in November 2005, which replaced the original FMP, and established spawning stock biomass target and threshold.¹ Addendum I (2010) to the Fishery Management Plan for Atlantic Croaker modified the management area and biological reference points. Addendum II established a precautionary management framework using the Traffic Light Approach. An Omnibus Amendment to the Interstate Fishery Management Plans for Spanish Mackerel, Spot, and Spotted Seatrout was adopted in 2011 to allow these species to be managed under the authority of the Atlantic Coastal Fisheries Cooperative Management Act². Addendum I to the Fishery Management Plan for Spot (2014) established a precautionary management approach using the Traffic Light Approach. There have been no interstate management requirements for either Atlantic croaker or spot.

Atlantic croaker - Biological reference points (BRPs) were established for croaker in the mid-Atlantic region in 2005. The BRPs were revised in 2011 (Addendum I)

following the 2010 ASMFC stock assessment and now apply to the entire Atlantic coastal stock.³ The BRPs set targets for fishing mortality (F) and spawning stock biomass (SSB), and are ratio-based. For the threshold, if $F/F_{MSY}=1$, overfishing is occurring. If $SSB/(SSB_{MSY}(1-M))=1$, the coastal stock is overfished. The 2011 ASMFC Atlantic Stock Assessment Technical Committee evaluated the stock assessment triggers in 2014 and found no evidence to alter management.¹ The 2013 ASMFC Action Plan called for the development of an addendum to consider alternate croaker trigger mechanisms. Existing management triggers were not considered an effective method to respond to changes in the fisheries. The Atlantic Croaker technical committee supported a new approach – a traffic light analysis, to evaluate the fishery.⁴ The traffic light approach (TLA) was approved in Addendum II to Amendment 1 of the Atlantic Croaker FMP (August 2014).⁵ The TLA incorporates multiple data sources into a single metric to provide management guidance. The TLA is useful for data-poor species management and replaces past assessment triggers. The development of state specific harvest reductions will occur if the harvest and abundance indices thresholds are exceeded for three consecutive years.

Maryland is required to submit an annual ASMFC Atlantic croaker compliance report. This report describes the fishery management program for Atlantic croaker, including fishery dependent and independent monitoring, regulations, commercial harvest reports and recreational catch estimates.³ Juvenile indices (seine and trawl) for the Maryland portion of the Chesapeake Bay have been calculated for every year since 1959. Maryland started a new gill net survey in the Choptank River to sample adult Atlantic croaker and spot in 2013.

Atlantic croaker Stock Status – Atlantic croaker is considered a single stock along the Atlantic Coast. Based on the 2010 ASMFC benchmark stock assessment, overfishing is not occurring but whether the stock is overfished, could not be determined due to data limitations.⁷ The 2010 stock assessment indicated that biomass was increasing and the age-structure of the population was expanding from the late 1980's through 2008. The next benchmark stock assessment is slated for completion in 2016. The ages of Atlantic croaker caught in Maryland pound nets in 2014 ranged from one to nine years old, with age two fish accounting for the majority of the catch. Atlantic croaker over age six have become less abundant since the mid-2000s, leading to a corresponding reduction in mean fish length.

Atlantic Croaker Fisheries – Commercial landings from Maryland and Virginia followed a similar trend (Figures 1 and 2) with periods of high harvest in the 1950s, late 1970s and late 1990s through the 2000s.⁸ Commercial landings have declined to more moderate levels in recent years. Maryland's 2014 landings were 552,000 pounds and Virginia landings were 4.8 million pounds; both, a decrease from 2013 (NMFS data). Recreational harvest and release estimates from the Marine Recreational Information Program (MRIP) are higher for Virginia than Maryland for the majority of years (Figures 3 and 4).⁹

Figure 1. Maryland commercial landings of Atlantic croaker from 1950-2014.⁸

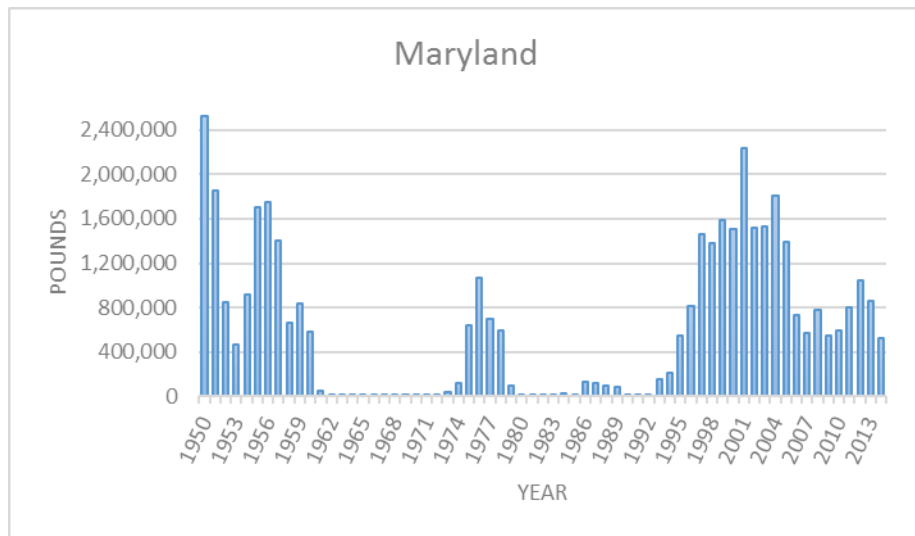


Figure 2. Virginia commercial landings of Atlantic croaker: 1950-2014.⁸

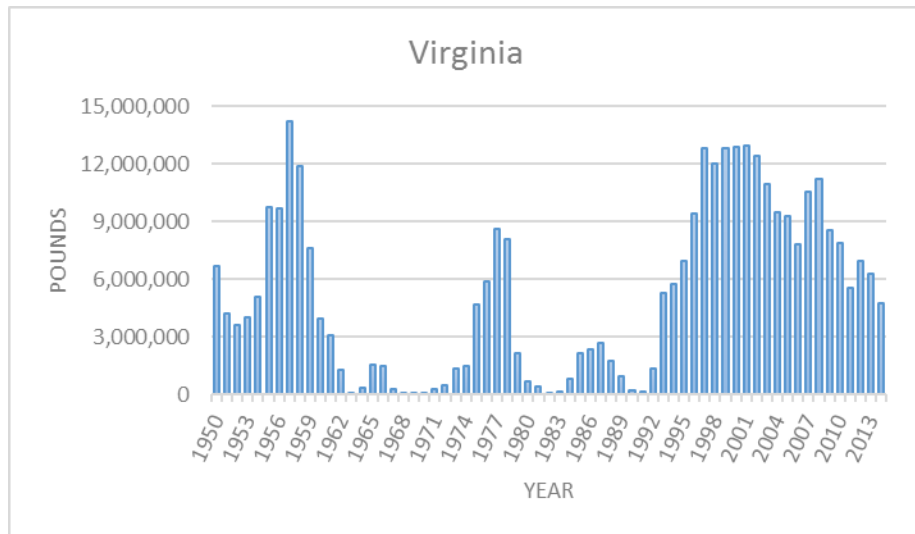


Figure 3. Maryland estimated recreational harvest and release for Atlantic croaker: 1981-2014.⁹

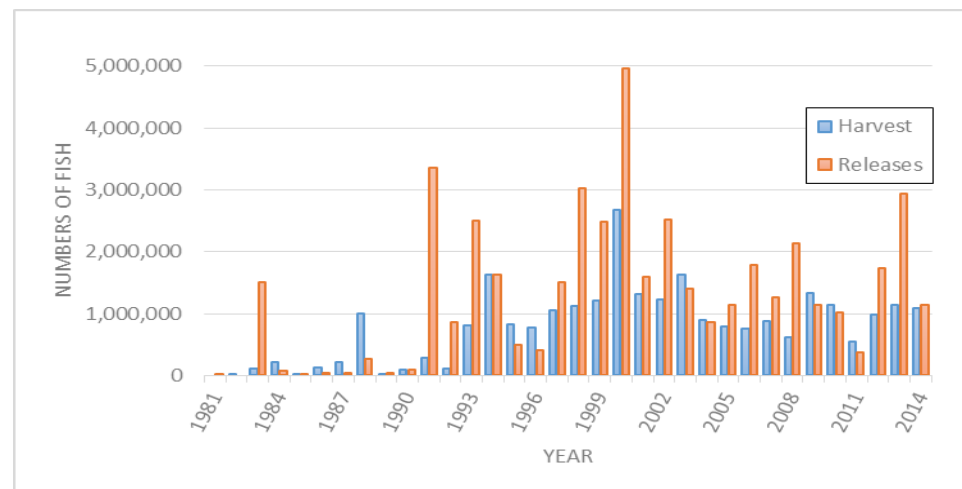
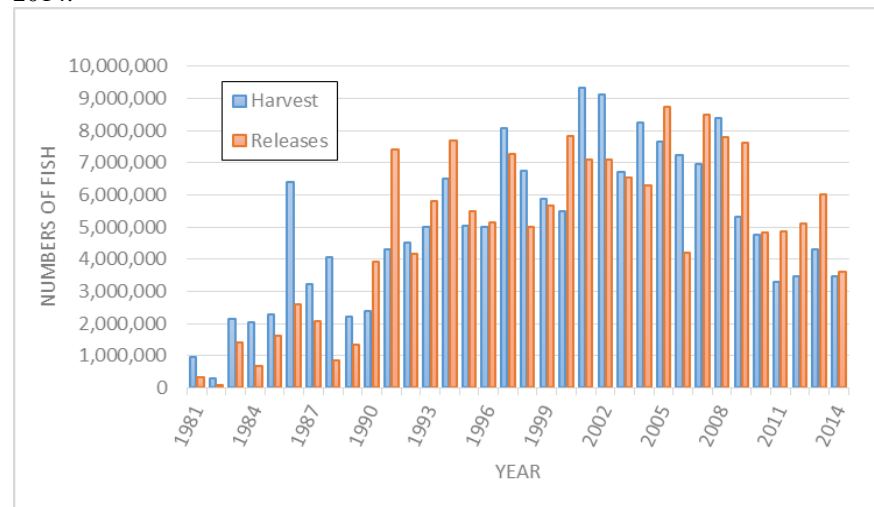


Figure 4. Virginia estimated recreational Atlantic croaker harvest and release, 1981-2014.⁹



Spot - The 2013 ASMFC Action Plan called for the evaluation of spot management triggers. As described above for Atlantic croaker, a similar TLA was approved for spot at the 2014 summer meeting of the ASMFC through an addendum to the Omnibus Amendment for Spanish Mackerel, Spot and Spotted Seatrout.^{2, 11} The TLA will provide management guidance until a stock assessment is completed in 2016. The TLA incorporates multiple data sources into a single metric and includes both population abundance and harvest data. This new framework replaces the management trigger approach using the 10th percentile and is particularly useful for short-lived species such as spot. If the thresholds are triggered for two consecutive years, then state-specific management actions will be developed.⁵ The ASMFC Spot Plan Review Team met in 2014 to review the trigger indices and did not recommend any management actions at this time.¹⁰

Spot Stock Status— Overfishing and overfished status remain unknown. Catch per unit effort (CPUE) data and harvest values have been used to evaluate the status of spot. There is some concern over declining trends, especially in the commercial fishery. Two juvenile indices (JI) are calculated to evaluate recruitment of spot in Maryland's portion of Chesapeake Bay. A JI is calculated for spot from the MD DNR Blue Crab Trawl Survey (BCS) and another from the Maryland Estuarine Juvenile Finfish Survey (EJFS). These indices are highly variable. Chesapeake Bay juvenile indices indicated a very strong 2010 year class but both 2011 JIs were low. The 2011 spot index derived from the EJFS JI was the lowest since 1967. Indices increase to near their time series means in 2012, but declined again in both 2013 and 2014.

Spot Fisheries

There is an order of magnitude difference in the commercial harvest of spot in Virginia and Maryland (Figures 5 & 6). However, commercial landings from both states indicate similar fluctuations across the years. Landings were higher in the 1950s, decreased in the 1960s and 1970s, and rebounded in the 1990s. Variability in spot landings is expected since it is a short-lived species. Year-class strength is impacted by annual environmental conditions. Recreational landings have been variable with additional fish caught but released (Figures 7 & 8). Compared to the other coastal states, Virginia recreational anglers have caught between 30% and 50% of the total coastal catch and Maryland recreational anglers have caught between 12% and 35% of the coastal catch based on the last ten years of estimated harvest data.

Figure 5. Maryland commercial landings of spot: 1950-2014.⁸

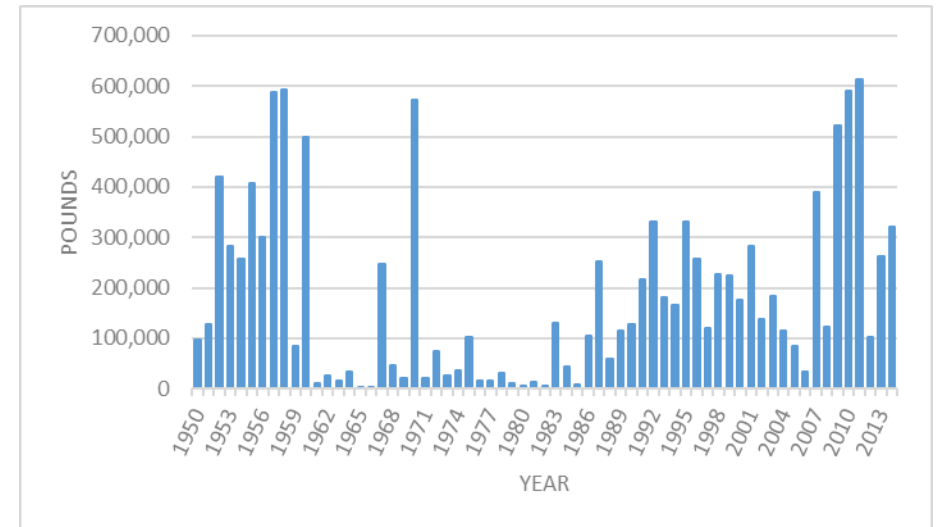


Figure 6. Virginia commercial landings of spot: 1950-2014.⁸

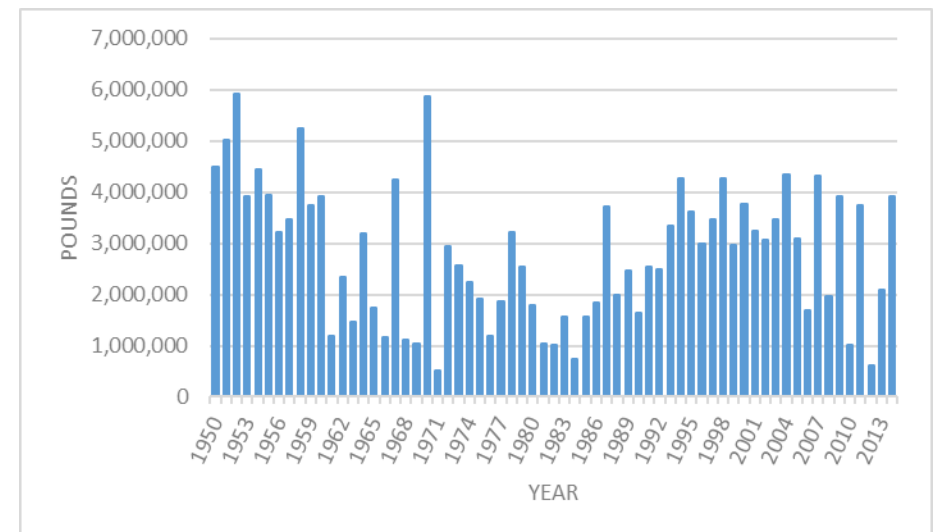


Figure 7. Maryland estimated recreational spot harvest and releases: 1983-2014.⁸

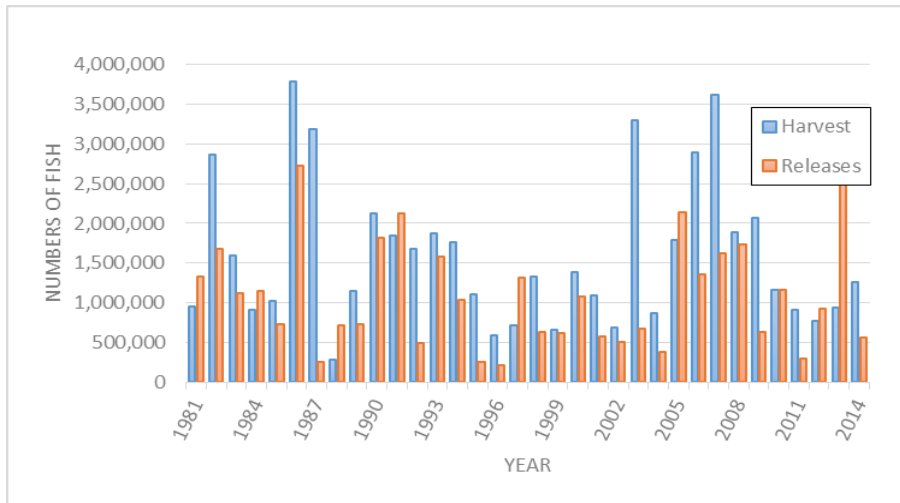
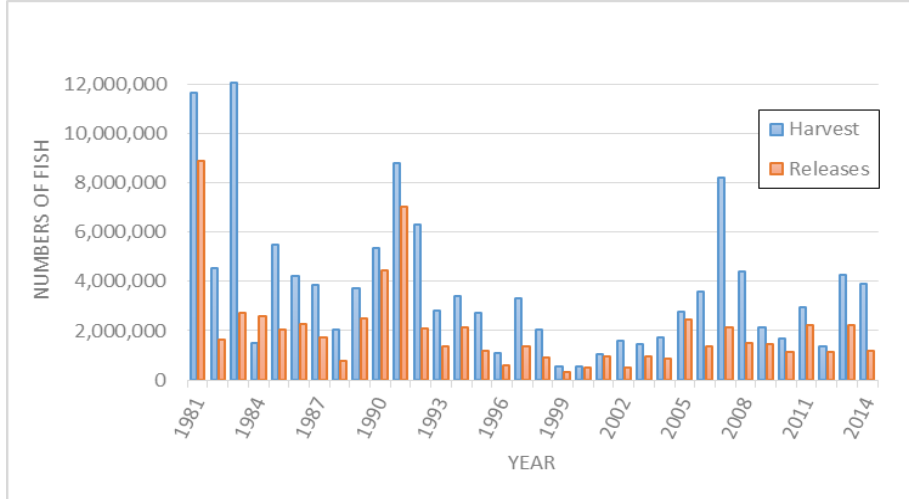


Figure 8. Virginia estimated recreational spot harvest and releases: 1983-2014.⁸



Management Measures

There are no management measures required by ASMFC to restrict the commercial or recreational fisheries for either croaker or spot. The adoption of the TLA is a precautionary management framework for both species. The coastal states are required to compile commercial and recreational harvest statistics and monitoring data. Annual spot and Atlantic croaker compliance reports have been required since 2012 and 2006, respectively.^{6,12} Maryland has a recreational minimum size limit of 9 inches for croaker and a creel limit of 25 fish per person per day. There is a commercial season from March through December and a 9 inch minimum size limit. There are no harvest restrictions for spot.

Issues/Concerns

Continued monitoring of the commercial and recreational harvest of both croaker and spot is important in order to obtain data for conducting stock assessments and evaluating the status of the stocks. There is some concern about the decreasing trend in commercial landings of spot along the coast. The ASMFC Spot Plan Review Team will continue to monitor the trend and make management recommendations if necessary. The use of circle hooks to reduce recreational discard mortality is encouraged. Both species are caught indirectly and together during other fishing activities; bycatch mortality is a continued concern. Small spot, for example, could account for as much as 80% of the shrimp trawl catch by weight and 60% by number, depending on area.¹³ States are encouraged to use bycatch reduction devices to reduce bycatch.

Spot have been increasingly used as live bait in the recreational striped bass fishery in the Chesapeake Bay. The consequences of using small spot as bait are unknown. Spot used for this live bait fishery are harvested in fish pots or by hook and line.

A winter kill in Chesapeake Bay estimated at two million juvenile spot occurred in late December 2010 and was associated with a sudden cold snap. The consequences of this winter kill are unknown but illustrate the vulnerability of this species to sudden cold snaps.

References:

¹ ASMFC 2005. Amendment 1 to the Interstate Fishery Management Plan for Atlantic Croaker. Fishery Management Report No. 44 of the Atlantic States Marine Fisheries Commission. Arlington, VA. 92p.

² ASMFC 2011a. Omnibus Amendment to the Interstate Fishery Management Plans for Spanish Mackerel, Spot, and Spotted Seatrout. Fishery Management Report of the Atlantic States Marine Fisheries Commission. Arlington VA 161p.

³ ASMFC 2011b. Addendum I to Amendment 1 to the Atlantic Croaker Fishery Management Plan. Arlington, VA 7p.

⁴ ASMFC 2014a. 2014 Review of the Atlantic States Marine Fisheries Commission Fishery Management Plan for Atlantic Croaker (*Micropogonias undulatus*) 2013 Fishing Year. Accepted August 2014.

⁵ ASMFC 2014b. Addendum II to Amendment I to the Interstate Fisheries Management Plan for Atlantic Croaker. Arlington, VA 7p.

⁶ Rickabaugh, H., Jr. 2015. Maryland Atlantic Croaker (*Micropogonias undulatus*) Compliance Report to the Atlantic States Marine Fisheries Commission – 2014. Maryland Department of Natural Resources Fisheries Service June 22, 2015.

⁷ ASMFC. 2010. Atlantic Croaker 2010 Benchmark Stock Assessment. Washington DC.

⁸ Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division, November 2015.

⁹ Personal communication from the National Marine Fisheries Service, Recreational Fisheries Statistics Division, Marine Recreational Information Program, September 10, 2015.

¹⁰ ASMFC 2014c. 2014 Review of the Atlantic States Marine Fisheries Commission Fishery Management Plan for Spot (*Leiostomus xanthurus*) – 2013 Fishing Year, Arlington, VA 14p.

¹¹ ASMFC 2014d. Addendum I to the Omnibus Amendment to the Interstate Fishery management Plans for Spanish Mackerel, Spot, and Spotted Seatrout, management of the Spot Fishery using the Traffic Light Approach. Arlington, VA. 7p.

¹² Rickabaugh, H., Jr. 2014. Maryland Spot (*Leiostomus xanthurus*) Compliance Report to the Atlantic States Marine Fisheries Commission - 2013 Maryland. Maryland Department of Natural Resources Fisheries Service October, 2014.

¹³ Peuser, R (editor). 1996. Estimates of finfish bycatch in the south Atlantic shrimp fishery. Final Report of the SEAMAP-South Atlantic Committee: Shrimp Bycatch Work Group. Washington DC: Atlantic States Marine Fisheries Commission.

1991 Chesapeake Bay Program Atlantic Croaker and Spot Fishery Management Plan Implementation (updated 10/15)			
Problem Area	Action	Date	Comments
Stock Status Annual abundance of Atlantic croaker and spot is highly variable from year-to-year. Little information is available on the causes of stock fluctuations.	Action 1.1 CBP jurisdictions will continue to participate in scientific and technical meetings for managing Atlantic croaker and spot along the Atlantic coast and in estuarine waters.	2005 2009 Continue	CBP jurisdictions will continue to monitor Atlantic croaker and spot stocks and cooperate with the ASMFC to manage stocks through inter-jurisdictional management measures. BRPs were adopted for the coastal croaker stock in 2005 and updated in 2010. Current estimates of F and SSB indicate that the croaker stock is healthy and overfishing is not occurring (ASMFC 2010). The status of the coastal spot stock is undeterminable. No stock assessment has been completed. The ASMFC Spot PRT has been monitoring stock status through reports to the South Atlantic Management Board. Annual spot and Atlantic croaker compliance reports to ASMFC are required. A coast wide stock assessment for both species was initiated in 2015 and is scheduled for completion in 2016.
	Action 1.2.1 A) MD and the PRFC have a minimum size limit for Atlantic croaker. B) VA does not have a minimum size limit for Atlantic croaker.	Continue 1993	CBP jurisdictions will promote the increase in yield per recruit for the Atlantic Croaker and spot fisheries. MD has a 9” minimum size limit for the croaker recreational and commercial fisheries. MD & PRFC also have a 25 fish/person/day creel limit. MD has an open commercial season from March 16 through December. VA does not have any restrictions.
	Action 1.2.2 CBP jurisdictions will evaluate the need to implement a minimum size limit for spot.	1992 2009 Continue	No recommendations have been made for spot. There is some concern over declining juvenile abundance. The ASMFC omnibus amendment, approved in 2011, did not require additional management criteria but recommended the implementation of conservation measures when any two measures of relative abundance indices (with at least one a fishery independent index) were equal to or below the data set’s 10 th percentile. With the adoption of addendums to the ASMFC amendments (August 2014), both croaker and spot are managed using the traffic light approach (see text for explanation).

1991 Chesapeake Bay Program Atlantic Croaker and Spot Fishery Management Plan Implementation (updated 10/15)			
Problem Area	Action	Date	Comments
Harvest of Small Croaker and Spot Incidental bycatch and discard mortality of small croaker and spot in non-directed fisheries is substantial and has the potential to significantly impact croaker and spot stocks.	Action 2.1 A) Through the ASMFC, the jurisdictions will promote the development and use of trawl efficiency devices (TEDs) in the southern shrimp fishery and promote the use bycatch reduction devices (BRDs) in the finfish trawl fishery. B) Virginia will continue its prohibition on trawling in state waters. Virginia will maintain its 2 ⁷ / ₈ inch minimum mesh size for gill nets C) Maryland will continue its 4-6 inch gill net restriction during June 15 through September 30 and implement a 3 inch minimum mesh size along the coast. D) PRFC will continue its prohibition on gill net fishing in the summer.	Continue Continue 1992 Continue	Commercial trawling is prohibited within the Chesapeake Bay in both MD and VA. The 2004 Croaker Stock Assessment indicated that the coastal states were successful at reducing mortality on age 1 fish. The commercial & recreational catch-at-age data showed an increasing age distribution with a few croaker at age 12. The stock assessment analyses indicated that the shrimp bycatch estimates are important to consider in the calculations but there needs a more comprehensive evaluation. ASMFC encourages states to use bycatch reduction devices (BRDs). MD currently allows attended gill nets with a stretched mesh size of 3 1/8 to 3 1/2 inches from January 1 through March 15 and 2 1/2 to 3 1/2 inches between March 16 and December 31 in the Chesapeake Bay and tributaries, with location restrictions during striped bass spawning seasons. The minimum stretched gill net mesh size in MD waters is 2 1/2 inches. Virginia has a minimum gill net stretched mesh of 2 7/8".
	Action 2.1.2 CBP jurisdictions will investigate the magnitude of the bycatch problem and consider implementing bycatch restrictions for the non-directed fisheries in the Bay	1992 On-going	CBP jurisdictions have evaluated the effectiveness of bycatch reduction panels in pound nets and PRFC requires reduction panels for all pound nets. Some coastal states are using panels to reduce bycatch of small fish.
Research and Monitoring Needs There is a lack of stock assessment data for both Atlantic croaker and spot stocks in the Chesapeake Bay.	Action 3.1 VMRC stock assessment program will continue to analyze size and sex data from Atlantic croaker and spot collected from the VA commercial fishery.	Continue	The amount of data available for croaker has increased since the 2003/2004 coastal stock assessment. The 2010 ASMFC coastal stock assessment update (benchmark) concluded that the coastal Atlantic croaker population is a single stock. Addendum 1 to the ASMFC FMP changed the management unit to a single stock and modified the BRPs. Stock assessment data for Atlantic croaker and spot is collected by the MD Estuarine Juvenile Finfish Survey, and VIMS Juvenile Abundance Surveys (formerly known as the VIMS Trawl Survey and the VIMS Juvenile Seine Survey), NEAMAP and ChesMMAP. Both Maryland and Virginia collect age, length, weight and sex data from commercially harvested spot and croaker.

1991 Chesapeake Bay Program Atlantic Croaker and Spot Fishery Management Plan Implementation (updated 10/15)			
Problem Area	Action	Date	Comments
	<p>Action 3.2</p> <p>A) MD and PRFC will encourage research to collect data on croaker and spot biology, especially estimates of population abundance, recruitment, and reproductive biology.</p> <p>B) VA will continue to fund its stock assessment research conducted by the conducted by VIMS and ODU, specifically designed to provide the estimates of population abundance, recruitment, and reproductive biology.</p>	<p>Continue</p> <p>Continue</p>	<p>An Atlantic Croaker Ageing Workshop was held in October 2008 and resulted in a standardized ageing procedure. High priority research & monitoring recommendations included: determining migratory patterns; collecting life history information; evaluating bycatch and discard practices; and examining reproductive strategies. Spot up to age 3 are regularly represented in the commercial fishery. Commercial catch-at-age data has contracted the last several years. Length-at-age and weight-at-age have decreased for ages 1-3. Spot age 4 to 6 years are not seen every year and when present, account for a small percentage of harvest. Recommendations for spot in the 2011 omnibus amendment include: monitoring data and gear studies on discards from the shrimp, recreational and commercial fisheries; expanding sampling; assessing BRDs; continuing development of fishery-dependent and fishery-independent size and sex specific relative abundance estimates; evaluating juvenile indices to predict year class strength; improving catch and effort statistics; and developing stock assessment analyses such as a yield-per-recruit analysis and determining the inshore vs offshore components of the fishery.</p> <p>Commercial pound net sampling in Maryland's portion of the Chesapeake Bay was conducted bi-weekly from late May through early September, 2014. Atlantic croaker mean length from the onboard pound net survey was 249 mm total length in 2014, and was the second lowest value of the 22 year time series. Ages ranged from one to nine years old, with age two fish accounting for the majority of the catch. Atlantic croaker over age six have become less abundant since the mid-2000s. Spot mean length from the onboard sampling decreased slightly in 2014 to 194 mm total length, and was below the mean value of 204 mm for the 22 year time series. Atlantic croaker juvenile abundance from the Maryland Chesapeake Bay Blue Crab Trawl Survey, was high in 2012, but declined in both 2013 and 2014, to the 10th lowest value of the 26 year time series. The spot Chesapeake Bay juvenile trawl index declined in 2013 and 2014, with the 2014 value being the 3rd lowest of the 26 year time series.</p>

1991 Chesapeake Bay Program Atlantic Croaker and Spot Fishery Management Plan Implementation (updated 10/15)

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Acronyms:

ASMFC = Atlantic States Marine Fisheries Commission;

BRPs = Biological Reference Points

CHESFIMS = Chesapeake Bay Fishery Independent Multispecies Fisheries Survey

ChesMMAP = Chesapeake Bay Multispecies Monitoring and Assessment Program;

CBP = Chesapeake Bay Program

FMP = Fishery Management Plan

ODU = Old Dominion University

PRFC = Potomac River Fisheries Commission

PRT = Plan Review Team

VIMS = Virginia Institute of Marine Science